

Right Person, Right Qualifications, Right Place, Right Time Human Resources (R4 HR) Technology Demonstration Project

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Force Structure Analysis Way-Ahead
24-27 January 2011



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Outline

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About Us : Who We Are

Director General Military Personnel Research and Personnel Analysis (**DGMPRA**) and the Defence Research and Development Canada Centre for Operational Research and Analysis (**DRDC CORA**) are two research organizations within the Department of National Defence of Canada (**DND**).

Mission:

Inform and facilitate the decision-making process of the Canadian Forces (**CF**), Government defence and security community in an objective, timely, credible and scientifically rigorous manner.



About Us: What We do

- DGMPRA and DRDC CORA conduct operational research and analysis for the DND/CF and our Security partners.
- This includes business process modeling and analysis.
 - Build models to examine the flows of resources through a business process.
 - What impact will decision X have on process Y?
 - How can process Y be improved?
 - How do processes Y and Z affect each other?
- Simulation is one of the powerful tools that we use for examining the potential compounding impacts of planned and unplanned events on resource supply and demand.



R4 HR TDP Motivation

- **Need**: Personnel and related resource management are ongoing critical, complex and challenging issues for DND/CF.
 - Mission success hinges upon having the **Right Person, with the Right Qualifications, at the Right Place at the Right Time (R4)**.
- **Gap**: The analysis and advice provided to the DND/CF has not reached its full potential in this area due to the technological limitations imposed by existing simulation software packages, primarily a lack of:
 - Flexibility
 - Scalability
 - Integration

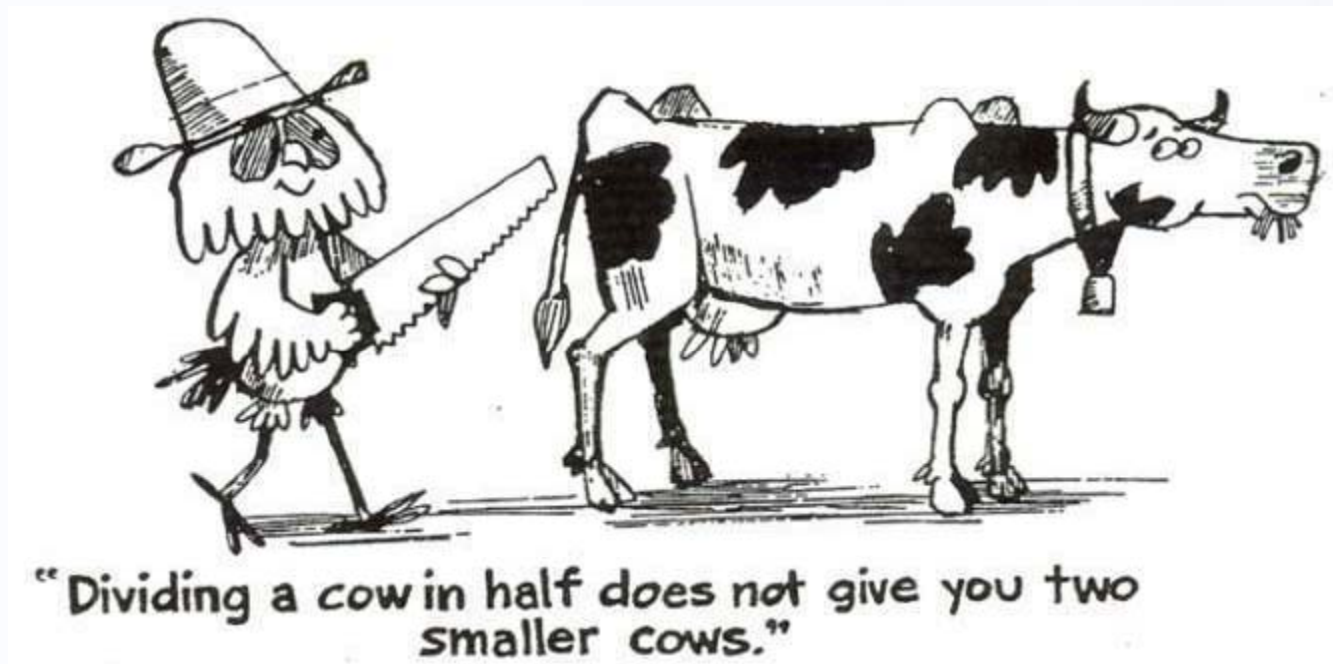


R4 HR TDP Motivation (Cont'd)

- **Flexibility:** hard to extend model logic beyond applications anticipated by the developer
 - Model logic is static and hidden in proprietary languages and file formats
- **Scalability:** some packages have limits on file sizes; all of the data needed is stored in simulation memory during execution
 - Large scale DND/CF resource management problems cannot be properly addressed as the model and/or data files are too big
- **Integration:** it is highly challenging (often impossible) to integrate models that were developed separately, but represent processes that are integrated in reality
 - Need to rebuild the desired “integrated model” from scratch



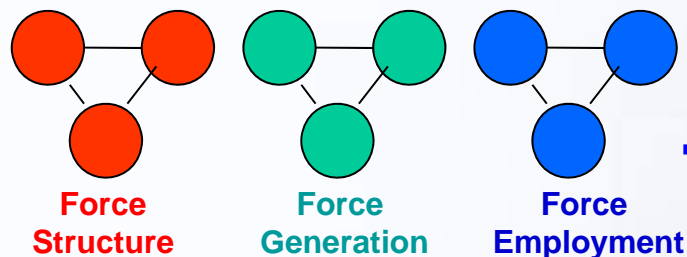
R4 HR TDP Motivation (Cont'd)



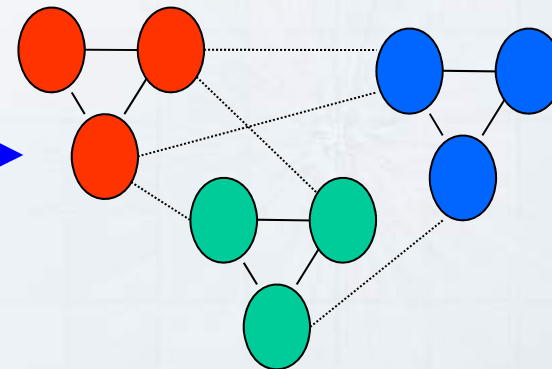
R4 HR TDP Vision

- Develop a novel simulation environment that will both encourage and foster the integration of stove-piped models into larger, more comprehensive and holistic system models, to provide previously unavailable insights for decision-making.

Current Modelling Approach



R4 HR Integrated Approach



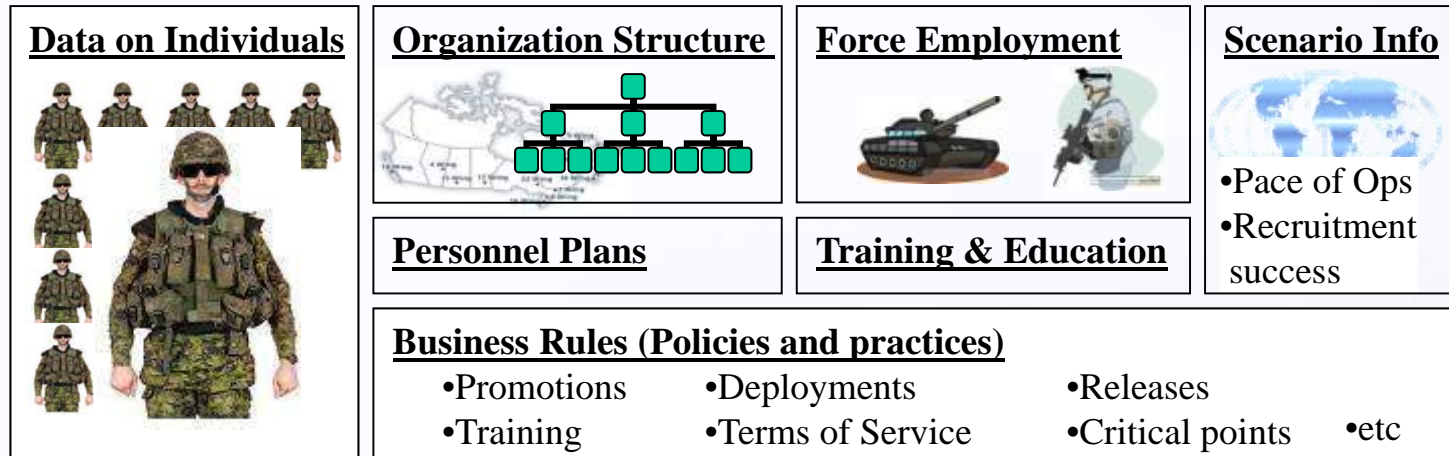
R4 HR TDP Concept

- A new integrated modelling and analysis software environment for conducting business process simulations, utilizing
 - An open scripting language that allows for fully dynamic and extensible model logic, facilitating modification, reuse and knowledge transfer
 - An integrated relational database capable of holding the entire simulation state including all data and model implementations
 - Efficient storage, retrieval, processing of a virtually boundless volume of data
 - Directly processed by the simulation engine using Structured Query Language (SQL)
 - An Actor construct that facilitates plug-and-play integration of any model components developed in the software



R4 HR TDP Concept (Cont'd)

Data Sources



Data Standards
(i.e. Human Views / DNDAF)

Communication Protocol

R4 HR Simulation Environment

Results, Advice

Which occupations risk going critical within 5 years?

Can an operation be undertaken without a strategic pause?

How long can an op'l surge be maintained?

Available personnel for next roto?

What should recruit targets be?

Which is impact of the operation on the ability to force generate and on CF future health?



R4 HR TDP Objective and Deliverables

Objective:

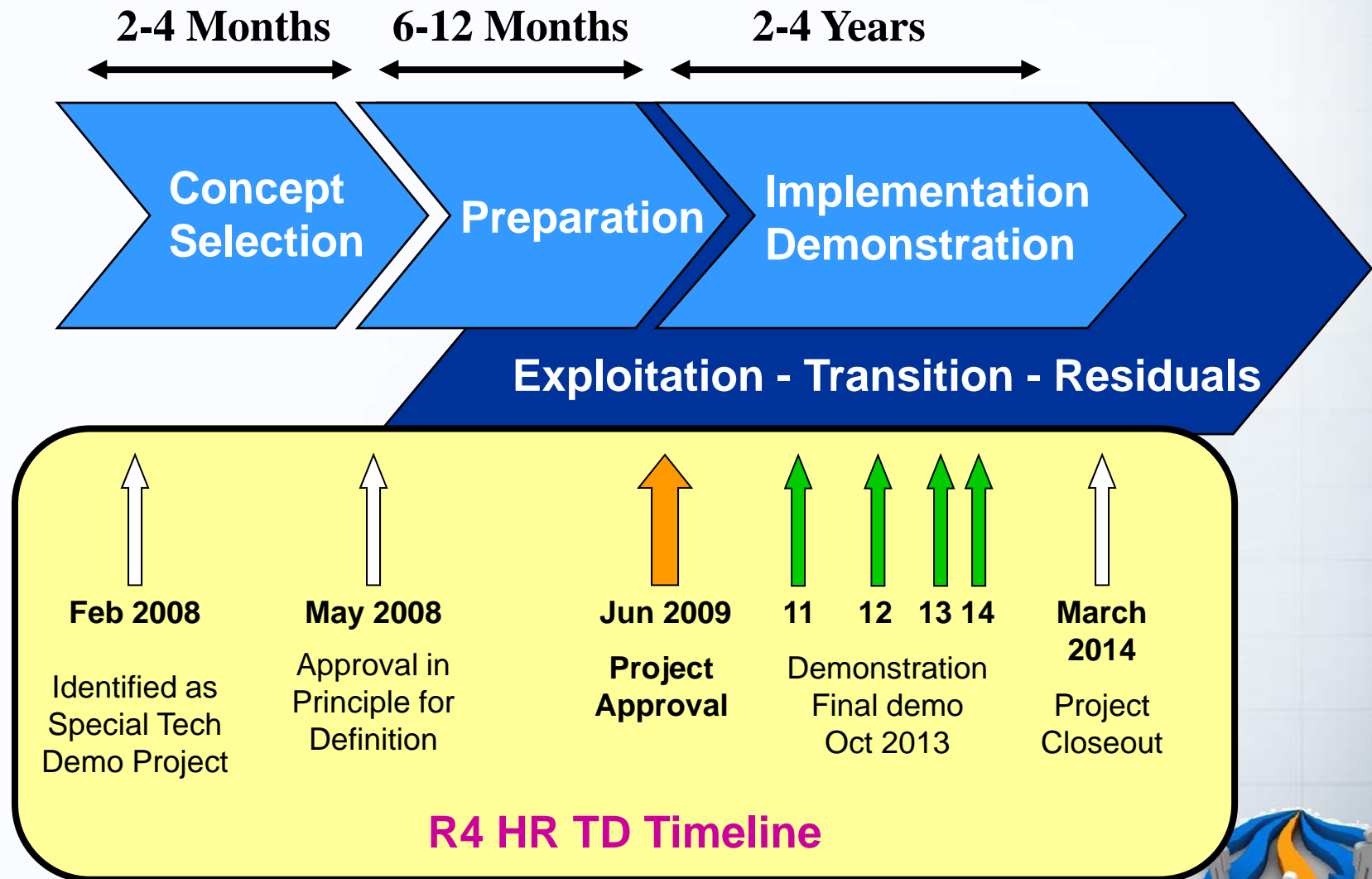
- To build and demonstrate a HR modelling and analysis tool that provides the means to examine integrated aspects of force structure, force generation and force employment

Deliverables:

- A new simulation engine integrating several powerful software technologies, optimized for large-scale resource management simulations
- Graphical user interface enabling
 - Convenient modelling and simulation development
 - Dynamic exploration, analysis and display of simulation results
- An architecture that is open to the incorporation of custom or third party algorithms



TDP Project Life Cycle



Project Status

- Prototype Simulation Engine
 - Developed in-house over the past year
 - Objective: To test and validate proposed software design prior to tendering of the full software development contract to Industry
 - Design was evaluated and validated by team in Sep 2010
 - Replicated the key functionalities of at least two existing business process models within the new modeling and simulation environment
 - Demo 1 showcased the prototype engine to Client and User Groups, Jan 2011



Next Steps

- Contract to Industry
 - RFP to be posted in Spring 2011
 - Prototype development has greatly focused the technical requirements definitions for the main TDP contract to industry
 - SMEs have been hired to assist with RFP preparation
- Demos & Case Studies
 - Demo 2: Integrate and execute 2 basic models in parallel
 - Demo 3: Complex Scenario Analysis / Modeling & Reporting GUIs
 - Demo 4: Enhancements / Advanced Techniques
- TD Project close-out by spring 2014



Discussion and Questions



